

IN THE CLAIMS:

Please AMEND the claims as follows:

1 **Sub** 1. (Currently Amended). An OFDM receiver, comprising:
2 **Ct** means for recovering and sampling an rf signal from a transmitter into in- phase (I) and
3 quadrature phase (Q) components of a baseband signal;
4 means for computing auto correlation amplitude and phase values of the I and Q
5 components at sample points;
6 **A3** means for averaging and saving the auto correlation values of the I and Q components
7 over L symbols for two or more frames before computing the correlation;
8 phase lock loop means for providing a sample number indicating an OFDM frame
9 boundary using the averaged I and Q auto correlation values and an output signal locked to the
10 transmitter rf signal;
11 means providing a receiver clock chain output phase locked to the transmitter rf
12 signal;
13 means providing an offset value indicative of the phase difference between the receiver
14 and a transmitter; and
15 means for correcting frequency and timing offset between the receiver and the transmitter
16 in the sample number.

1 2. (Original Claim) The OFDM receiver of Claim 1 further comprising:
2 means for estimating frame synchronization of the OFDM frame boundary.

1 3. (Original Claim) he OFDM receiver of Claim 1 further comprising:
2 means for phase locking the transmitter and the receiver.

1 4. (Original Claim) The OFDM receiver of Claim 1 further comprising:
2 means for estimating the transmitter and receiver frame offset.

1 5. (Original Claim) The OFDM receiver of Claim 1 further comprising:
2 means responsive to the sample number and a negative phase angle of the auto correlation
3 values for correcting for frequency synchronization, frame synchronization, and
4 transmitter/receiver frequency offset.

1 6. (Original Claim) The ODFM receiver of Claim 1 further comprising:
2 means responsive to a sampling clock for generating the I and Q of the received signal.

1 7. (Original Claim) The OFDM receiver of Claim 1 further comprising:
2 means for storing the sampled I and Q components coupled to the auto correlation means
3 and a correcting means.

1 8. (Original Claim) he OFDM receiver of Claim 1 further comprising:
2 means for storing the averaged auto correlation values coupled to an offset estimator and
3 a frame synchronization estimator.

1 9. (Currently Canceled Without Prejudice)

2 10. (Currently Amended) The OFDM receiver of Claim 9 22 further comprising;
3 amplifier means responsive to the means for integrating and rounding off providing a
4 coherent clock signal for the ~~transmitter~~ transmitter and the receiver.

1 11. (Sub. C2) (Currently Amended) The OFDM receiver of Claim 10 22 further comprising;
2 a programmable counter responsive to the coherent clock signal and a receiver clock for
3 generating a receiver clock chain phase locked to ~~the~~ a clock in the transmitter.

1 12. (Currently Amended) A method of correcting timing and frequency offset in an
2 OFDM receiver, comprising the steps of:
3 sampling in-phase (I) and quadrature phase (Q) components of a ~~baeband~~ baseband
4 signal;
5 computing auto-correlation amplitude and phase values of the I and Q components;
6 estimating a frame boundary of the received signal;
7 providing a sample number indicating a correct frame boundary;

estimating frequency and timing offset in the sample number of the receiver and a
transmitter; and
correcting the frequency and timing offset in the sample number.

1 13. (Original Claim) The method of Claim 12 further comprising the step of:
2 using the amplitude of the auto-correlation function to estimate the frame boundary.

1 14. (Original Claim) The method of claim 12 further comprising the step of:
2 using the negative of the phase angle of the auto-correlation value as an estimated
3 frequency offset at the sample number.

1 15. (Original Claim) The method of Claim 12 further comprising the step of:
2 applying the estimated frame boundary to a phase-locked loop.

1 16. (Original Claim) The method of Claim 12 further comprising the step of:
2 generating a coherent phase clock signal for the transmitter and the receiver.

1 17. (Original Claim) The method of Claim 12 further comprising the steps of:
2 Storing the I and Q component values;
3 providing the stored I and Q values for auto-correlation; and
4 providing the stored values for offset correction.

1 18. (Original Claim) The method of claim 12 further comprising the steps of:
2 storing the auto correlation values;
3 providing the auto-correlation values to a frame estimator;
4 providing the auto-correlation values to an offset estimator.

1 19. (Original Claim) The method of Claim 12 further comprising the steps of:
2 adjusting the phase angle of each sample in a storing means by an amount proportional to
3 “n” where “n” is counted from a correct frame boundary.

1 20. (Original Claim) The method of Claim 12 comprising the step of:
2 averaging the auto-correlation values over frames in a storage device.

1 21. (Currently Amended) In an IBOC system including a filter coupled to a converter,
2 a first storage means coupled to the converter and to a correlator, a second storage means coupled
3 to a frame synchronization estimator and an offset estimator, a phase locked loop coupled to the
4 frame synchronization estimator and to the offset estimator, and an offset correction means
5 coupled to the first storage means, the offset estimator and the phase locked loop, a method of
6 correcting timing and frequency offset between a transmitter and a receiver in the system,
7 comprising the steps of :
8 sampling in-phase (I) and quadrature phase (Q) components of a received signal;

9 computing auto-correlation amplitude and phase values of the I and Q components for
10 two or more frames;

11 estimating a frame boundary of the received signal;

12 providing a sample number indicating a correct frame boundary using a phase lock loop;

13 providing a receiver clock chain output phase locked to the transmitter;

14 estimating the transmitter and receiver frequency and timing offset in the sample number;

15 and

16 correcting the frequency and timing offset in the sample number.

22. (New Claim) An OFDM receiver, comprising:

means for recovering and sampling an rf signal into in- phase (I) and quadrature
phase (Q) components of a baseband signal;

means for computing auto correlation amplitude and phase values of the I and Q
components at sample points;

means for averaging the auto correlation values of the I and Q components over L
symbols;

means for providing a sample number indicating an OFDM frame boundary using the averaged I and Q auto correlation values, the phase locked loop comprising:

means responsive to a first and a second frame synchronization signal for providing a difference signal indicative of the frame difference between the transmitter and receiver ;

means for averaging differences over a series of frames as a frame difference output;

means for processing the frame difference output through a filter ;

means responsive to the filter for integrating and rounding off the frame difference output to the nearest integer value; and

counter means responsive to the integer value providing a sample number for a desired frame boundary;

means providing an offset value indicative of the phase difference between the receiver and a transmitter; and

means for correcting frequency and timing offset between the receiver and the transmitter in the sample number .